

REMARKS

Claims 1-21 are pending in the present application. In the Office Action mailed March 26, 2007, the Examiner rejected claims 8, 9, and 12 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner next rejected claim 1 under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. (USP 5,713,358) in view of Watts et al. (US Pub. 2003/0032877). Claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Watts et al., and further in view of Jezzard, Peter “Physical Basis of Spatial Distortions in Magnetic Resonance Images.”

Claims 6, 7, 10, 11, and 13-21 were allowed. Claims 2 and 3 were indicated as containing allowable subject matter. Such indication is appreciated.

The specification was objected to by the Examiner. Per these objections, Applicant has amended the Abstract and paragraph [0029] of the specification. In light of these amendments, Applicant believes that the objections to the specification should be withdrawn.

The drawings were objected to by the Examiner as failing to comply with 37 CFR 1.84(p)(5). The Examiner asserted that Fig. 4 did not include reference signs mentioned in paragraph [0005] of the specification. Specifically, the Examiner asserted that the elements “linear interpolation ($B^{\#2}$),” “linear interpolation ($C^{\#2}$)” and “linear interpolation ($D^{\#2}$)” were set forth in paragraph [0005] and not identified in Fig. 4. Applicant believes that an EPAGE formatting error caused these elements to be displayed incorrectly in the published specification. As such, Applicant has amended paragraph [0005] in the specification to correct this deficiency. As amended, the elements “linear interpolation (B’),” “linear interpolation (C’)” and “linear interpolation (D’)” should now appear correctly. Each of these elements, B’, C’, and D’, are all clearly identified in Fig. 4. In light of the amendments, Applicant believes that the objection to Fig. 4 under 37 CFR 1.84(p)(5) should be withdrawn.

The Examiner rejected claim 8 under 35 U.S.C. 112, second paragraph, stating that “the phrase ‘immediately preceding sampled peripheral from’ is incomplete and unclear.” *Office Action*, March 26, 2007, p. 4. While Applicant disagrees, Applicant has nonetheless elected to amend claim 8 to further clarify what is being called for therein. Claim 8 calls for the MRI apparatus set forth in claim 7 wherein the increase in delay is a linear increase in delay time. As amended, Applicant believes that claim 8 conforms to the requirements of §112 and that the rejection should therefore be withdrawn.

The Examiner rejected claim 9 under 35 U.S.C. 112, second paragraph, stating that “[a]ccording to the disclosure, delays before sampling k-space center increase linearly with peripheral region distance from k-space center” *Office Action*, supra at 4. Applicant agrees with the Examiner’s characterization of the specification; however, Applicant believes that what is called for in claim 9 is not contradictory to this disclosure, as suggested by the Examiner. Claim 9 calls for delay time after sampling a first peripheral region to be a multiple of the delay time that is observed after sampling of a second peripheral region. Applicant would point out that the delay time after sampling a first peripheral region can be a multiple of the delay time that is observed after sampling of a second peripheral region while still displaying a linear relationship. That is, as set forth in ¶29 of the specification, if a delay time encompassing five zero-encoding pulses is played out between acquisition of region-B and region-A, then a delay time encompassing ten pulses would be played out between acquisition of region-C and region-A, and a delay time encompassing fifteen pulses would be played out between acquisition of region-D and region-A. This is a linear increase and, concurrently, is also multiples of a delay time. As such, Applicant believes that which is called for in claim 9 is supported by the specification.

In rejecting claim 9 under 35 U.S.C. 112, second paragraph, the Examiner also stated that “[t]he claim wording with regard to ‘first’ peripheral region being a multiple of ‘second peripheral region’ is in conflict with/contradicts what is disclosed: specifically, that the immediate prior peripheral region delay determines the immediate subsequent peripheral region delay....” *Office Action*, supra at 4. Applicant respectfully disagrees. In calling for delay time after sampling a first peripheral region to be a multiple of the delay time that is observed after sampling of a second peripheral region, claim 9 does not require that a delay for the first peripheral region occurs prior to the delay for the second peripheral region. That is, “first peripheral region” and “second peripheral region” are merely identifiers and do not relate the sequence. For the first peripheral region to be a multiple of the second peripheral region, the

Claim 9 does not set forth that the first peripheral region delay is determined by/from the second peripheral region delay. Rather, claim 9 merely sets forth that the delay time after sampling a first peripheral region is a multiple of the delay time that is observed after sampling of a second peripheral region. There is no requirement set forth in claim 9 that the first peripheral region delay (i.e., the immediate prior peripheral delay) be determined from the second peripheral region delay (i.e., the immediate subsequent peripheral delay) as the Examiner suggests. The terms “first peripheral region” and “second peripheral region” are merely identifiers. For the delay for the “first peripheral region” to be a multiple of the delay for the “second peripheral

region,” there logically must be two delay periods to compare. Applicant respectfully believes that the Examiner has misconstrued what is being called for in claim 9, as claim 9 does not call for the first peripheral region delay to be based on the second peripheral region delay. For at least these reasons set forth above, Applicant believes that claim 9 conforms to the requirements of §112 and that the rejection should therefore be withdrawn.

The Examiner also rejected claim 12 under 35 U.S.C. 112, second paragraph, stating that “[t]here is insufficient antecedent basis with reference to the ‘*one of phase-encoding gradient pulses and slice-encoding gradient pulses*’ component of the limitation in the specification.” *Office Action*, supra at 5. Applicant has elected to amend claim 12 to further clarify what is being called for therein. As amended, claim 12 calls for the amplitude of one of the zero-encoding pulses along the phase-encoding axis and the zero-encoding pulses along the slice-selective axis to increase as the distance of each peripheral region from the center region increases. Applicant believes that proper support for amended claim 12 is found in the specification, as zero-encoding pulses along the phase-encoding axis and the slice-selective axis are described therein. Therefore, Applicant believes that amended claim 12 conforms to the requirements of §112 and that the rejection should therefore be withdrawn.

The Examiner rejected claim 1 under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Watts et al. While Applicant does not necessarily agree with the rejection, Applicant has nonetheless elected to amend claim 1 to incorporate the allowable subject matter of claim 2. As amended, claim 1 calls for, in part, a method of MR data acquisition that includes the step of sampling peripheral regions of k-space at a pre-selected temporal rate and waiting a predetermined period of time before sampling a next region of k-space if the next region of k-space is a center region of k-space, wherein the center region is sampled at a higher temporal rate and wherein the predetermined period of time is a function of peripheral region distance from the center region of k-space. As claim 1 has been amended to include the allowable subject matter of claim 2, Applicant believes that claim 1 and the claims dependent therefrom are patentably distinct over the combination of Mistretta et al. and Watts et al.

In addition to the above remarks and amendments, Applicant has also amended claim 3 to properly reflect its chain of dependency. Furthermore, claim 2 has been canceled.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1 and 3-21.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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